

# ACM TRANSACTIONS ON DATABASE SYSTEMS

---

**Volume 6 • 1981**

**Editor in Chief**

Robert W. Taylor

**Associate Editors**

Rudolf Bayer  
Philip A. Bernstein  
Michael Hammer  
David Kuck  
Vincent Y. Lum

Stuart E. Madnick  
Howard L. Morgan  
James B. Rothnie  
Gerard Salton  
Eugene Wong

Published by the Association for Computing Machinery

Copyright © 1981, Association for Computing Machinery, Inc.  
1133 Avenue of the Americans, New York, NY 10036

---

**Volume 6 • 1981**

## **Contributed Papers**

- 1** On the Design of Relational Database Schemata  
by Carlo Zaniolo and Michel A. Melkanoff
- 48** Hierarchical Schemata for Relational Databases  
by Y. Edmund Lien
- 70** Support for Repetitive Transactions and Ad Hoc Queries in System R  
by D. D. Chamberlin, M. M. Astrahan, W. F. King, R. A. Lorie, J. W. Mehl, T. G. Price,  
M. Schkolnick, P. Griffiths Sellinger, D. R. Slutz, B. W. Wade, and R. A. Yost
- 95** Security of Statistical Databases: Multidimensional Transformation  
by Jan Schlörér
- 113** Statistical Database Design  
by Francis Y. Chin and Gultekin Ozsoyoglu
- 140** The Functional Data Model and the Data Language DAPLEX  
by David W. Shipman
- 174** Time- and Space-Optimality in B-Trees  
by Arnold L. Rosenberg and Lawrence Snyder
- 194** New File Organizations Based on Dynamic Hashing  
by Michel Scholl
- 213** On Optimistic Methods for Concurrency Control  
by H. T. Kung and John T. Robinson
- 227** Processor Allocation Strategies for Multiprocessor Database Machines  
by Haran Boral and David J. DeWitt
- 255** Transformation of Data Traversals and Operations in Application Programs to Account  
for Semantic Changes of Databases  
by Stanley Y. W. Su, Herman Lam, and Der Her Lo
- 295** Design of an External Schema Facility to Define and Process Recursive Structures  
by Eric K. Clemons
- 312** A Database Encryption System with Subkeys  
by George I. Davida, David L. Wells, and John B. Kam
- 329** An Improved Third Normal Form for Relational Databases  
by Tok-Wang Ling, Frank W. Tompa, and Tiko Kameda
- 347** Comments on SDD-1 Concurrency Control Mechanisms  
by Gordon McLean, Jr.
- 351** Database Description with SDM: A Semantic Database Model  
by Michael Hammer and Dennis McLeod
- 387** A Normal Form for Relational Databases That Is Based on Domains and Keys  
by Ronald Fagin
- 416** Associative Hardware and Software Techniques for Integrity Control  
by Y. C. Hong and Stanley Y. W. Su

- 441 Frame Memory: A Storage Architecture to Support Rapid Design and Implementation of Efficient Databases  
by Salvatore T. March, Dennis G. Severance, and Michael Wilens
- 464 High-Level Programming Features for Improving the Efficiency of a Relational Database System  
by Reind P. van de Riet, Anthony I. Wasserman, Martin L. Kersten, and Wiebren de Jonge
- 486 Dense Multiway Trees  
by K. Culik, II, Th. Ottmann, and D. Wood
- 513 Analysis of a Heuristic for Full Trie Minimization  
by Douglas Comer
- 539 Consequences of Assuming a Universal Relation  
by W. Kent
- 557 Update Semantics of Relational Views  
by F. Bancilhon and N. Spyratos
- 576 An Object-Oriented Approach to Database System Implementation  
by A. James Baroody, Jr., and David J. DeWitt
- 602 Query Processing in a System for Distributed Databases (SDD-1)  
by Philip A. Bernstein, Nathan Goodman, Eugene Wong, Christopher L. Reeve, and James B. Rothnie, Jr.
- 626 Human Factors Comparison of a Procedural and a Nonprocedural Query Language  
by Charles Welty and David W. Stemple
- 650 Efficient Locking for Concurrent Operations on B-Trees  
by Philip L. Lehman and S. Bing Yao
- 671 Analysis of Index-Sequential Files with Overflow Chaining  
by Per-Åke Larson
- 681 Index

